

PATENT SPECIFICATION



Application Date : July 26, 1920. No. 31,648 / 21.

174,891

Complete Accepted : Jan. 26, 1922.

COMPLETE SPECIFICATION.

Process for Producing Finely Granulated Compounds.

I, ADOLF WELTER, of Krefeld-Rheinhafen, Germany, German citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:

A process proposed by me in a previous Patent Application No. 136,841 for the production of soda containing water of crystallisation, or of mixtures thereof with other substances, consists in steam, water, snow, or hydrous solutions of soap, Glauber's salt, or water-glass being sprayed upon commercial pulverized calcined soda or mixtures thereof and in preventing liquefaction or caking by keeping the soda in motion, whilst preferably also cooling the same.

I have also found that my afore-mentioned process is capable of other applications, inasmuch as soda containing water of crystallisation or mixtures thereof are not the only products that can be made by it. More specifically, this process may be used for providing hygroscopic salts, which are apt to decompose when exposed to air, with a protective enveloping layer that appreciably enhances their durability.

A particularly important application of the process consists in using it for enveloping oxidising and reducing agents, which are liable to be affected by the weather or catalysers, with stabilisers. By this means the use of metals in the construction of the apparatus required for the operations is rendered possible, as the absorption of ferric combinations that act as catalysers is precluded. Another advantage offered by the process is that if the fine division of particles is maintained during the whole process, it is possible to use lower temperatures than hitherto in

drying operations, on account of the very considerable increase of the exposed surface. The thus extended process is particularly useful for imparting durability to all so called percombinations and to sodium hydrosulphite and similar reducing agents, and for coating these substances with water-glass or the like. I have also found that a specially advantageous manner of carrying out such processes consists in introducing the liquid in a finely divided form into the upper part of a tower, and in mixing fine particles of the solid substances with the moist vapor thus formed by suction or compressed air, or by mechanical contrivances, and by finally directing air of a lowered or an increased pressure against the falling moistened particles so that the substance arrives at the bottom in a dry and non-caked condition.

To carry out the process in this latter form the particular liquid is sprayed in the finest possible particles in the upper part of a tower of any desired material, it being of no consequence how this is done, or whether the spraying device itself is inside or outside of the tower. The fine solid particles that are adapted for taking up the nebulous spray are then pressed or sucked into the upper part of the tower through lateral holes in the same, or these particles are made to form a dust cloud by mechanical means, when a thorough moistening and an exceedingly great surface formation will occur. The solid moistened particles will now drop down in the tower. On their way to the bottom they will be thoroughly dried by the current of air sucked or pressed through the tower, so that they now will not cake. If the air drawn or pressed out of the top of the tower, should still contain small floating solid particles,

these can easily be separated by any preferred kinds of filtering devices.

This form of the process permits of very low towers and very brief drying operations being employed. Besides the temperatures used for desiccating may be very low, which is a great advantage in treating bodies which are easily decomposed. This form of the process is also adapted for continuous working and is very economical.

EXAMPLE:

Crystalline perborate of sodium is sucked or blown into the upper part of a wooden tower of a height of about 30 feet and about 7 to 9 feet in diameter and water-glass solutions of about 30 to 40° B. are squirted through fine spraying nozzles onto the sodium perborate clouds. For better supervision glass windows are provided in the tower. The air current produced in the tower by suction or pressure soon causes the water to evaporate and the particles of perborate coated with a protecting layer of water-glass drop without caking to the bottom of the tower, or the small quantity of them that are carried away by the desiccating current of air can be separated from it by dust chambers. In this way a perborate of sodium powder is obtained each granule of which is coated with a protective layer, and which will keep for an indefinite period. But if perborate of sodium were mixed with a water-glass solution in the ordinary way, a hydrous crystalline paste would result which, before long, would become stiff. It is exceedingly difficult to dry this crystalline paste well enough to render it capable of being ground, even if it is previously broken into fragments. Iron mills would be required for the grinding operation and hence iron would be absorbed which would act as a catalyst and assist in decomposing the

perborate. In my aforescribed novel process, however, not the slightest amount of oxygen is lost and no iron whatever enters the product.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A process for imparting durability to chemicals that are prone to change when exposed to air, consisting in spraying on to the pulverised chemicals or mixtures in question, substances in a liquid form, that are adapted to prevent the decomposition of the said chemicals or mixtures, and in keeping the latter moving, and preferably also cooling or drying them so as to prevent their liquefaction or caking. 55

2. A method of carrying out the process claimed in Claim 1, consisting in diffusing the liquid in the upper part of a tower and in introducing, by suction or compressed air, or mechanical means into the vapour thus formed, the pulverized chemical and in directing an air current against the moistened particles dropping in the tower, so that the substance arrives at the bottom in a dry and non-caked state. 60

3. The improved process as described in connection with the example given in the specification. 65

Dated this 25th day of November, 1921. 70

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Reference has been directed, in pursuance of Section 7, Sub-section 4, of the Patents and Designs Acts, 1907 and 1919, to Specifications No. 5490 of 1908, No. 26,384 of 1908, and No. 18,330 of 1911. 85